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Urtica dioica L., Torbay, N. F.
Juniperus communis L., Bay of Bulls, N. F.
Larix americana Mx., Bay of Bulls, N. F.
Habenaria lacera R. Br., Guysborough, N. S.
Goodyera repens R. Br., Open Hall, N. F.
Spiranthes romanzoviana Cham., Carbonier, Cape Broyle, N. F.
Calopogon pulchellus R. Br., Arichat, Cape Breton island.
Juncus effusus, Arichat, Cape Breton island.
Carex rostrata Mx., Arichat, Cape Breton island.
" *vulgaris* Fries, Arichat, Cape Breton island.
Agrostis vulgaris With., Cape Broyle, N. F.
Festuca ovina L., Redcliffe island, N. F.
Poa annua L., Guysborough, N. S.
" *debilis* Torr., Cape Broyle, N. F.
Aspidium spinulosum Suz., Cape Broyle, N. F.
Lycopodium annotinum L., Bay of Bulls, N. F.

—*Henry L. Osborn.*

Botanical Notes.—The new "students' garden" at Kew is an excellent design, well calculated, if properly cared for, to foster a knowledge of botany, and excellently adapted to impart an idea of what botany means to the many thousands of visitors who make excursions to the gardens. The *Gardeners' Chronicle* has recently advocated the establishment of "school gardens," where practicable, and we see no reason why they should not be established wherever there is a public park. In several continental countries they can be counted by hundreds, and in the country of Linnæus by thousands.——In a recent paper on the impurities of drinking water caused by vegetable growths, published by Prof. W. G. Farlow in the first annual report of the Massachusetts Board of Health, attention is especially called to the Nostoc group. These bluish-green algæ so long as they are living and not excessively abundant, produce no perceptibly bad effect on the water, but when they decay in large quantities they give rise to the pig-pen odor, as it is called, which has in recent years caused considerable trouble and still more alarm. The water thus affected becomes too offensive to drink, and cannot be entirely purified by filtering. No absolute remedy is suggested or probably can be, but ponds should be cleared of weeds and substances in which the nostocs may lodge and develop, and the water in the pond should not be allowed to fall rapidly. One of the two plates illustrates the harmless desmids, etc., and the second the injurious nostocs.——It appears that the Ningpo hats, of which 15,000,000 were exported in 1877, many being sold in the Southern United States, are made from a sedge, *Cyperus tegetiformis*.——The development of the colors of flowers is discussed by Dr. Hermann Müller in *Kosmos*.

ZOÖLOGY.[1]

A Relation between Meteorology and the Grasshopper or Locust Pest.[2]—In the winter of 1877–1878 I made a short preliminary study of some of the relations of climate to the so-called "locust pest" of our Western States. An abstract of my results was published in chapters VII (pp. 203–211) and XV (pp. 424–432) of the "First Annual Report of the U. S. Entomological Commission for the year 1877 relating to the Rocky Mountain Locust, &c., &c."

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[1] The departments of Ornithology and Mammalogy are conducted by Dr. Elliott Coues, U. S. A.

[2] Read before the National Academy of Sciences.

Although the results then arrived at were crude because of the paucity of proper material, yet as nothing better has since then appeared and as the subject has not come to the notice of some who might aid in securing further precise data, I will take the liberty of bringing the matter to the attention of the naturalists of the Academy, to whom we must look for the accurate determination of the thermal constant that we need in order to attain to results that may be practically useful to the community—premising only that I have merely broken the ground for some one else to build.

My idea is that it would be an important advance toward protecting the agricultural districts if we were able at any day to say: "Up to this date the grasshopper eggs have been rapidly (or slowly) progressing towards hatching, and they are now within five (or other number) days of appearing."

But in order to accomplish this we must know the normal time of incubation, which probably must depend principally upon the temperature to which its egg is exposed, and upon the peculiarity of the locust egg as an organized body having the inherent vital power of development.

The meteorologist and the biologist must here work in union. I have, however, presumed for the first effort to undertake at least an approximate solution of both questions, and present here the conclusions that are given at greater length in the pages before referred to.

I. The Heat of Incubation.—It may be assumed that in these eggs, as in all similar animal and vegetable germs, a certain definite amount of heat represented by an exposure for a definite number of hours to a uniform, definite temperature will always effect the hatching of the young. From the study of the observations made by Dr. C. V. Riley, I concluded that at temperatures below 50° Fah., the development of the egg progresses very slowly if at all—although the vitality is not destroyed by temperatures of 15° F. I found that the few available observations led to the following approximations:

1. At a uniform temperature of 50° F. the eggs require 65 whole days or 1560 hours to hatch.
2. " " 60° " " 60 " " 1440 " "
3. " " 70° " " 55 " " 1320 " "
4. " " 80° " " 50 " " 1200 " "

It may be that at higher temperatures the development proceeds at a more rapidly increasing rate; indeed, one correspondent says that at a temperature of 100° F. the eggs hatched out in a few hours—but nothing is known as to whether the eggs were fresh or not, and the observer's name itself is also unknown, therefore I have restricted the above table to that range of temperature within which we have satisfactory observations, and which corresponds most nearly to what generally occurs in practice.

The above table may also be put in the general algebraic form:

$$\text{In hours } H = 1560 - 12\,(T - 50^\circ)$$
$$\text{In days } D = 65 - \tfrac{1}{2}\,(T - 50^\circ)$$

where T represents the average temperature to which the eggs are exposed. We see from this that the heat received by the eggs while resting for sixty-five days in a light, dry, sandy soil at a uniform temperature of 50° F. is the least that will hatch them, while the additional term $\frac{1}{2}\,(T-50^\circ)$ represents the acceleration of the process consequent upon maintaining a higher temperature.

II. The Temperature experienced by the Eggs in the Ground.—In order to apply the results of the preceding section we must know the temperature of the ground in which the eggs are deposited, that is to say especially the duration of such temperatures as are above 50° F.

Actual observations of the soil at depths of one-half, one, one and a-half, two inches, &c., are, so far as I know, sadly lacking in this country, and rarely to be found in Europe, although very much needed in special investigations. An exhaustive review of our knowledge on the subject of earth temperatures has been published, during the past year, by Wild, of St. Petersburg, but it is concerned mostly with temperatures at greater depths than six inches, and relates, therefore, to terrestrial physics rather than to agricultural interests.

In the absence of direct observations, I have therefore adopted as a working hypothesis some empirical approximate relations between the air temperatures (published in the annual report of the Chief Signal Officer, Gen. A. J. Myer) and soil temperatures at the depth of one-half inch, from which I have deduced the following table showing for each station the total number of hours in each month during which the eggs must have been exposed to temperatures of over 50° and reduced to an equivalent of 60°.

Month.	Fort Garry. Lat. 50°	Breckenridge. Lat. 46.5°	Yankton. Lat. 42.5°	North Platte. Lat. 41.5°	Dodge City. Lat. 37.5°	Corsicana. Lat. 32.0°
1875.						
July	558	434	496	558	620	744
August	372	310	372	496	558	744
September	324	406	480	540	600	720
October	48	180	275	348	540	600
November	0	36	60	72	264	464
December	0	0	28	60	144	372
1876.						
January	0	0	20	20	120	324
February	0	0	24	64	150	324
March	0	0	0	54	104	464
April	66	78	184	276	324	600
May	324	290	366	464	558	744
June	504	420	480	540	600	720

By adding up the number of hours in each vertical column of this table, we obtain the total duration of exposure to a hatching temperature of 60° F., or the total progress that the egg has made toward the full complement of 1440 hours required for hatching according to the results of section 1.

For example, eggs laid so late as the 1st of September, 1875, at the respective stations, would have made progress and would hatch about as follows :

Station.	Latitude.	Eggs laid September 1, 1875		Average dates of hatching Riley Locust Plague.
		Will have experienced	Will hatch	
Fort Garry .	50°	1264 hours of temperat'e 60° by June 30	Early in July, 1876	June
Breckenridge	46.5	1410 " " " June 30	" " "	3d week in May
Yankton . .	42.5	1407 " " " May 31	" June "	Middle May
North Platte	41.5	1434 " " " April 30	" May "	First of May
Dodge City .	37.5	1404 " " " Nov. 30	During Dec , 1875	April
Corsicana . .	32°	1320 " " " Oct. 31	" Nov., "	March

This table agrees roughly with the dates published in Riley's Locust Plague, p. 97, but is here given only as a sample of what should be possible when we have a better determination of the heat of incubation and have actual observations of the temperature of the soil. In such case we should week by week, as the season advances, make up a statement of the actual progress of the eggs towards the completion of their period of incubation, thus giving the husbandman abundant warning of the birth of the young insect, and giving him more precise data by which to determine, in any case, the best date to plant or sow in order to avoid the ravages of the pests.—*Cleveland Abbe.*

FORSTER'S TERN IN FLORIDA.—Forster's terns (*Sterna forsteri* Nutt.) were quite common here for two months, November and December, 1879. One specimen was secured. Mr. J. A. Allen (On Mammals and Birds of East Florida) says, "I have no evidence of its occurrence here at this season."—*Thomas W. Wilson, Seville, Volusia Co., Fla.*

AN EARLY SEASON.—This year (1880) the Batrachians were stirring very early. I heard "peepers" (*Hyla pickeringii* Holb.) March 4, and was told that they had been heard twice before (February 29, and the other still earlier date not stated).

February 26 a full-grown *Amblystoma punctatum* was brought to me alive. It was found in the woods. March 30 I saw as many as thirty bunches of eggs of *A. punctatum* in the water. I think this salamander lays its eggs by the middle of March, regardless of cold. For a few days during the last of February and the first of March the weather was warm and spring-like, but after that it became so cold that the pools were coated with ice several times.

Another peculiarity of this season was the excessive drought in May, which dried up several of the pools. Since then the rains have filled them again, but the salamanders have disappeared. They were not developed enough at the time to leave the water, and so probably perished.

In one pool I found an abundance of the half-grown larvæ of *H. pickeringii* or *Hyla versicolor*, but they were the only Batrachians seen. Usually one can find as many as six varieties in this place. Either the tree toad larvæ were not hatched, or they have a way of caring for themselves when the water dries up, better than other species.—*S. P. Monks.*

A Fresh Water Jelly Fish.—An adult medusa belonging to the order Trachymedusæ, allied to Aglauropsis from the coast of Brazil, was observed by Mr. Sowerby in the tank in the water lily house in Regent's Park, London, June 10th. It occurred in great abundance in perfectly fresh water at a temperature of 90° Fahr. Mr. Sowerby observed the medusa feeding on water fleas (Daphnia). The specimens were adult males, and are described by Prof. Ray Lankester in *Nature* for June 17, under the name of *Craspedacusta sowerbii.* It was probably introduced from the West Indies. This is the first instance known of fresh water jelly fishes; Hydra and Cordylophora being, so far as we are aware, the only fresh water Hydroids. The succeeding number of the same journal contains additional valuable descriptions of the same medusæ by Prof. Allman and Mr. G. J. Romanes.

Zoological Notes.—It seems that kangaroos have increased in the Australian colonies so as to become a serious evil. On one run, in the Stanhope district, it was computed that there were at least 60,000 head of marsupial animals, every one of which will eat as much as a sheep. On a run in Queensland visited by Mr. Inglis, there were 40,000 head of sheep, and the owner had destroyed more than that number of kangaroos.——It is well known that snakes swallow their young in case of danger; Mr. E. G. Blackford now states that ten sharks, two feet in length and apparently about six months old, were taken from the stomach of a mackerel shark (*Lamna punctata*), as if they had got there to avoid danger. Still it is probable that sharks may eat their young.——Mr. W. S. Ball, of Greensboro, N. C., complains that swarms of honey bees attacked his grapes, "destroying nearly half."——The first part of a new volume, the first, of Bronn's Thier-reichs, on the Protozoa, by Dr. O. Bütschli, has appeared. This will undoubtedly prove to be the best general work on these organisms, and will be of much interest to microscopists. An English work on the Infusoria, by W. Saville Kent, is announced to begin to appear in the autumn in monthly parts. ——In Prof. Newton's article on the goose, in the *Encyclopædia Britanica*, he remarks that the predominance of the white variety in domestication may be due in part to the practice of plucking the birds alive, "for it is well known to bird-keepers that a white feather is often produced in place of one of the natural color that has been plucked out." The reviewer adds that saddle-galls on horses become covered with white hairs; and that he possesses a black cat which has a white star on its head where it was picked by a fowl in kittenhood.——The stridulating organs of spiders have been described by Westring and Mason Wood; those of still other spiders (*Steatoda guttata* and *Linyphia tenebricola*), of both sexes, have recently been described by Mr. F. M. Campbell.——It is claimed by M. Pasteur that earth-worms carry about the bacteridium germs of the disease called anthrax in their alimentary canal; that the dust of the earth mixed with the infected blood gets blown about the herbage with the worms' excrement, and the cattle devouring the grass become infected.——Soon to be published is Mr. St. George Mivart's "The Cat; an introduction to the study of back-boned animals, especially Mammals."——A number of new species of spiders from the Western and Southern States, though mostly from the Pacific coast of South America, are described by Count Keyserling in the Transactions of the Imperial Zoölogical and Botanical Society in Vienna for 1880.——In an essay in the *Morphologischer Jahrbuch* on the anatomy of dibranchiate Cephalopoda or cuttles, Dr. Brock discusses the phylogeny of these animals. He thinks that the Octopods, or poulps, have been derived from shell-bearing forms, Argonauta having, in the young, the rudiment of a shell capsule, while Cirroteuthis, which is not a true Decapod, has an internal shell; while the ink-bag is originally a part of the hind gut, in Sepia only is it connected by a long efferent duct with the anus. He then asks how Sepia came to retain its shell, when in other cuttles it is simply horny. He thinks that Sepia may be a direct descendant of the belemnites.

ANTHROPOLOGY.[1]

ANTHROPOLOGY AT THE AMERICAN ASSOCIATION.—Of the hospitality and general enthusiasm which characterized the Boston meeting, accounts will be found elsewhere and especially in the *Daily Boston Advertiser* from Aug. 26th to Sept. 2. Our purpose is to give a list of the anthropic papers and a brief sketch of their contents.

1. Ethnology of Africa. A. S. Bickmore.
2. Myths and folklore of the Iroquois. Erminnie A. Smith.
3. Prehistoric altars of Whiteside county, Ill. W. C. Holbrook.
4. Theory of primitive democracy in the Alps. D. W. Ross.
5. Ancient mounds near Naples, Ill. J. G. Henderson.
6. The mounds of Illinois. Wm. McAdams.
7. Prehistoric and early types of Japanese pottery. E. S. Morse.
8. Scheme of the tenth census for obtaining statistics of untaxed Indians. Garrick Mallery.
9. Stone implements from the river drift of New Jersey. C. C. Abbott.
10. Indications of Pre-Indian occupancy of the Atlantic coast of North America subsequent to that of palæolithic man. C. C. Abbott.
11. The probable existence in America of the prehistoric practice of trepanning in the cutting of rondelles or amulets from the skull. R. J. Farquharson.

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[1] Edited by Prof. OTIS T. MASON, Columbian College, Washington, D. C.